IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of	:
	:
Leonard M. Greene	: Group Art Unit: 3644
	:
Serial No.: 10/659,334	: Examiner: Tien Quang Dinh:
Filed: September 11, 2003	:

For: HELICOPTER TURBINE ENGINE PROTECTION SYSTEM

APPLICANT'S BRIEF ON APPEAL

Sir:

The applicant submits herewith a Brief in support of his Appeal from a Final Rejection by the Primary Examiner of claims 11-13 in the above-captioned application. The requisite fee of $250.00 as set forth in USPTO fee code 1402/2402 accompanies this Brief.

REAL PARTY OF INTEREST

The real party of interest is Safe Flight Instrument Corporation, a corporation of New York

RELATED APPEALS AND INTERFERENCES

The Applicant and the Applicant's attorney know of no other appeal or interference which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

STATUS OF CLAIMS

Claims 11-13 were finally rejected on May 4, 2005 and are the subject of this appeal. A copy of Claims 11-13 as amended, are attached hereto in the CLAIMS APPENDIX.

STATUS OF AMENDMENTS

The Amendment of February 7, 2005 has been entered.

SUMMARY OF CLAIMED SUBJECT MATTER

The following is a concise explanation of the invention as defined by claims 11-13 which are involved in this appeal. The summary includes the page, paragraph and line numbers which refer to the Applicant's specification as well as figures and numbers which refer to elements in the specification and claims.

The present invention relates to a helicopter turbine engine protection system (page 1, line 1) and more particularly to a helicopter engine protection system that injects water and/or alcohol into the engine when an over-stress condition is approached (page 1, first paragraph). As illustrated in Figure 1, a helicopter 20 having a turbine engine 22 mounted therein includes an over-stress protection system (page 3, lines 21 and 22, next

to last paragraph).

The helicopter 20 also includes a tank 24 for containing a supply of water and/or alcohol (page 3, lines 24 and 25). The tank 24 is operatively connected to an injector 26 which is adapted to inject an engine coolant such as water and/or alcohol into the engine when the engine temperature exceeds a predetermined value or when the rate of temperature verses time exceeds a pre-selected value (page 3, last paragraph, emphasis added). A pump 21 and valve 23 are disposed along the conduit 25 for supplying a pre-selected amount of coolant from the tank 24 to the injector 26 (page 3, last line to page 4, line 2).

Means such as a ground based tank 30 is adapted to provide a supply of coolant during a start up procedure. In the alternative, a quick disconnect coupling 29 of conventional design may be provided in the tank 24. In either case, water and/or alcohol is provided to the injector 26 during a start up procedure while maintaining the airborne tank 24 full of coolant (page 4, first full paragraph).

Data storage means and means for imputing a safe temperature profile for starting a helicopter turbine engine are referred to on page 5 in the second full paragraph. As stated therein, "....a start 23 is initiated as provided in an FAA approved procedure. However, at the inception, or more preferably before initiating a start up procedure a safe temperature or safe temperature profile is inputted into a computer...." Inputting a temperature profile may be used so that immediate action can be taken as soon as an actual temperature falls outside of the profile.

A sensor 32 such as a thermocouple is connected to a computer 34 for measuring the outlet temperature of the engine. Thus, when the turbine outlet temperature exceeds a predetermined value the computer sends a signal to the pump 21 and/or valve 23 to feed a

volume of coolant to the injector 26. The water and/or alcohol then cool the engine sufficiently to continue an engine start up procedure. In cases, when the turbine outlet temperature is not sufficiently reduced, the start up procedure is aborted...(see page 4, second full paragraph).

Inputting a temperature profile may be used so that immediate action can be taken as soon as an actual temperature falls outside of the profile. It is also believed that the use of a temperature profile may be a more effective perameter which allows remedial action to be implemented earlier as the actual temperature approaches a dangerous condition (page 5, lines 11-14).

The helicopter turbine engine over-stress protection system as called for in amended 11-13 also includes means for sensing at least one critical operating perimeter during flight operations. For example, a torque takeoff 48 of conventional design is provided for measuring actual torque during flight operations. A tachometer is also provided for indicating engine speed. In addition, a temperature sensor 53 or thermocouple is provided for sensing turbine output temperatures (see page 4, lines 28-31).

Then when the turbine outlet temperature exceeds a pre-determined value, the computer sends a signal to the pump 21 and/or valve 23 to feed a volume of coolant to the injector 26. The water and/or alcohol then cools the engine sufficiently to continue an engine start procedure (page 4, lines 11-14).

The helicopter turbine engine protection system also includes means for injecting water and/or alcohol into the helicopter engine during a start up procedure while maintaining the airborne tank full of water and/or alcohol. As set forth on page 4, lines 17-19 "The use of a ground based tank 30 during a start up reduces the weight of the coolant in the tank 24 and

allows a sufficient quantity of coolant for use during flight operations when an unsafe temperature or critical perimeter are approached or exceeded.

The claimed invention also includes a quick disconnect coupling for disconnecting the supply of water and/or alcohol from the ground based source after completion of the start up procedure. As stated on page 4, lines 4-7, "...a quick disconnect coupling 27 is provided in the conduit 25, between the tank 24 and injector 26... In the alternative, a quick disconnect coupling 29 of conventional design may be provided in the tank 24".

In addition, independent claim 11, also calls for means for injecting water and/or alcohol from the airborne tank into the turbine engine in response to an over-stress condition during flight operations. As set forth in Applicant's specification, "during flight operations, actual turbine output temperature and other perameters are sensed in step 68 and monitored in step 70... However, if the safe temperature or critical perimeters are exceeded, water and/or alcohol are injected from the airborne tank into the engine (page 6, lines 7-12)."

ISSUE TO BE REVIEWED ON APPEAL

The sole issue in this appeal is whether claims 11-13 that were rejected under 35 U.S.C. §103(a) are patentable over Moore 4,619,110 in view of Grondin et al., 5,035,811, Jensen 6,616,835 or Mathews et al. 6,585,009 and Latin 4,174,808.

ARGUMENTS

It is respectfully submitted that claims 11-13 are clearly and patentable distinguished over Moore 4,619,110 in view of Grondin et al., 5,035,811, Jensen 6,616,835 or Mathews et al. 6,585,009 and Latin 4,174,808.

As stated in 35 U.S.C. §103(a).

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in Section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious, at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. (Emphasis added.)

In addition, the Manual of Patent Examining Procedure (Eighth Edition Revision Two May 2004) § 2141.35 at p. 2100-98 states:

> When applying 35 U.S.C. 103, the following tenents of patent law must be adhered to:
>
> (A) The claimed invention must be considered as a whole;
>
> (B) The references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination;
>
> (C) The references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention; and
>
> (D) Reasonable expectations of success is the standard with which obviousness is determined. (Emphasis added.)

In the present case, the subject sought to be patented is not disclosed or suggested by the cited references. In the aforementioned Office Action, the Examiner rejected claims 11-13 under 35 U.S.C. §103(a), "as being unpatentable over Moore in view of Grondin *et al.*, Jensen, or Matthews *et al.* and Latin." In making that rejection the Examiner stated:

> Moore discloses a helicopter engine warning and control system that has a computer system that measures the temperature of the engine, storing data at which the helicopter can start safely, comparing temperatures, and having a source of water/alcohol that makes sure the engine is operated safely. Moore discloses all claimed parts except for the use of a ground source of water/alcohol and the quick disconnect coupling. However, Grondin et al., Jensen, or Matthews et al. discloses that the use of ground source of water/alcohol is well known in the art. Latin discloses that quick disconnect couplings are well known in the art.

It is respectfully submitted that Moore does not disclose or suggest "storing data in which the helicopter can start safely" as alleged by the Examiner. Moore refers over and over to problems during the operation of a helicopter such as when a helicopter pilot is required to lift a heavy load from a location where the quarters are relatively confined or cramped. (see column 5, lines 2-12) Clearly Moore does not address the problem of "hot starts" or an 810°C to 927°C maximum 10 second transition limitation discussed on page 1 of applicant's specification. In other words, Moore addressed a different problem and has not disclosed or suggest storing data at which the helicopter can start safely.

In addition to the above, there is one major difference between Applicant's claims 11-13 and Moore that has apparently been overlooked by the Examiner. The difference relates to Applicant's use of a temperature profile as opposite to a single preselected temperature.

To be more specific, claims 11-13 call for:

data storage means and means for inputting a safe temperature profile for starting the helicopter turbine engine; (Emphasis Added.)

Claims 11-13 also call for:

comparison means for producing a signal when the actual engine temperature falls outside of the safe engine temperature profile during start-up of the engine; (Emphasis Added.)

For comparison, Moore teaches at column 3, lines 1-10, that an audio alarm is activated with warning signals when the temperature of the turbine engine as sensed exceeds the predetermined levels, when the torque output...exceeds predetermined limits...when the speed of the engine exceeds predetermined speed limits.... At column 4, lines 7-10 the patent states:

...reduces fuel flow thereby maintaining the helicopter operation below the limits mentioned hereinabove relative to temperature, torque and speed.

Further in column 5, lines 7-12 the patent teaches:

...the additional problem that the helicopter pilots attention must be directed to avoid obstacles and the like. Accordingly, there is considerable potential for overstressing the engine because the pilot cannot keep his eye on the cockpit instrumentation where a high temperature or other factors would be indicated.

It is respectfully contended that Moore does not disclose or suggest "inputting a safe temperature profile for starting the helicopter turbine engine" or " producing a signal when the

actual engine temperature falls outside of the safe engine temperature profile during the start-up of the engine.

From the above, it is clear that Moore is not concerned with avoiding "hot starts" and does not suggest the use of a safe temperature profile for starting a helicopter turbine engine as called for in claims 11-13.

As taught on page 5 of Applicant's specification inputting a safe temperature profile during start-up into the computer allows remedial action to be implemented earlier i.e., as soon as the actual temperature versus a safe temperature profile (a time-temperature curve) exceeds a comparable time temperature curve in the profile as opposed to waiting for the temperature to reach a critical value. Applicant's concept is not disclosed or suggested by Moore or any other cited reference.

Further, on page 3 of the aforementioned Office Action, the Examiner stated:

> In response to applicant's arguments that Moore does not teach a means for inputting a safe temperature profile, please note that this is part of the computer system to control the helicopter. In this day and age, computers are programmed by keyboards and mice. Thus keyboards and mice are used to input a safe temperature profile. Plus, why would one skilled in the art want to input unsafe temperature profile that can damage the helicopter?

It is true that computers are programmed by keyboards and mice which are well known. However, the concept of using a safe temperature profile to avoid "hot starts" is not taught by

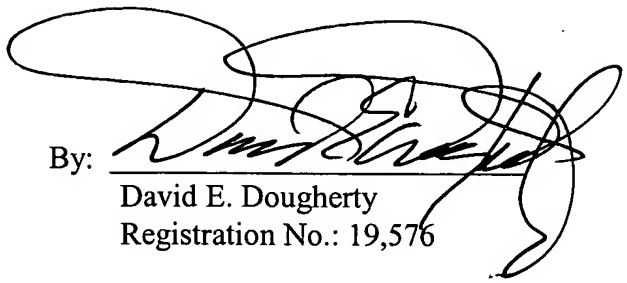
any of the references. Clearly, there is no disclosure and no suggestion in Moore or any of the other references to input a safe temperature profile into a system and to abort a start-up when the actual time and temperature exceeds the time and temperature in the profile for a safe start-up.

In response to the Examiner's question, as to "...why would one skilled in the art want to input an unsafe temperature profile that can damage the helicopter," applicant does not do so. What applicant does do is to enter a safe temperature profile, and as soon as the actual temperature at any time during a start up of the engine falls outside of the profile, take appropriate action to avoid a "hot start". As for example, injecting water and/or alcohol into the helicopter engine. This concept is not disclosed or suggested by Moore or any of the other references.

Finally, it is respectfully submitted that Grondin *et al.*, Jensen, or Matthews *et al.* do not show the use of a ground source of water/alcohol for an aircraft. What they do disclose is a filter pump system with a screen, a system for periodic fluid maintenance of apparatus and a coolant recycling system. Accordingly, it is Applicant's contention that these references have no bearing on the use in a helicopter and that such references do not disclose or suggest Applicant's unique combination of elements. Clearly, there is no suggestion in any of the references to suggest the concept wherein a cooling liquid is available to avoid a hot start and, if used, is replenished before take-off so that an adequate supply of cooling liquid is available for a subsequent overstressed condition.

In view of the above, the Examiner's rejection of claims 11-13 under 35 U.S.C. §103(a) should be reversed.

Respectfully submitted,



Dated: November 4, 2005

By: _____
David E. Dougherty
Registration No.: 19,576

DENNISON, SCHULTZ, DOUGHERTY & MACDONALD
1727 King Street
Suite 105
Alexandria, Virginia 22314
Tele: 703-837-9600 Ext. 17
Fax: 703-837-0980

CLAIMS APPENDIX

IN THE CLAIMS:

Claims 1-10 and 14 previously cancelled, claim 11 previously presented and claims 12 and 13 original as filed.

1. (Cancelled)

2. (Cancelled)

3. (Cancelled)

4. (Cancelled)

5. (Cancelled)

6. (Cancelled)

7. (Cancelled)

8. (Cancelled)

9. (Cancelled)

10. (Cancelled)

11. (Previously Presented) A helicopter turbine engine over-stress protection system comprising:

a helicopter;

a helicopter turbine engine mounted in said helicopter;

an airborne tank for containing water and/or alcohol disposed within said helicopter and an inlet for receiving water and/or alcohol from a ground source of water and/or alcohol;

data storage means and means for inputting a safe temperature profile for starting the helicopter turbine engine;

means for measuring the actual engine temperature during start up of a helicopter turbine engine;

means for sensing at least one critical operating parameter during flight operations;

comparison means for producing a signal when the actual engine temperature falls outside of the safe engine temperature profile during start up of the engine;

means for injecting water and/or alcohol into the helicopter engine during a start up procedure while maintaining said airborne tank full of water and/or alcohol;

a quick disconnect coupling for disconnecting the supply of water and/or alcohol from the ground based source after completion of the start up procedure; and

means for injecting water and/or alcohol from said airborne tank into the turbine engine in response to an over-stress during flight operations.

12. (Original) A helicopter turbine engine over-stress protection system in accordance with Claim 11 in which said injection means automatically injects water and/or alcohol into said turbine engine in response to an engine over-stress during flight operations.

13. (Original) A helicopter turbine engine over-stress protection system in accordance with Claim 11 in which said inlet is separate from said airborne tank.

14. (Cancelled)

EVIDENCE APPENDIX

N/A

RELATED PROCEEDINGS APPENDIX

N/A

CERTIFICATE OF SERVICE

N/A